```
Enter the number of messages to simulate: 10
Enter packet loss probability [enter 0.0 for no loss]:0
Enter packet corruption probability [0.0 for no corruption]:0
Enter average time between messages from sender's layer5 [ > 0.0]:1000
Enter TRACE:1
A received aaaaaaaaaaaaaaaa from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaa) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received cccccccccccccc from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: ccccccccccccc) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received dddddddddddddddddf from application layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddddddddddddf from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received a packet (SEO: 1. ACK: 0. Checksum: 1901. Pavload: dddddddddddddddddddd) from network laver laver
A received eeeeeeeeeeeeeeeee from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeee) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff from network layer layer
A received a packet (SEO: 0. ACK: 1. Checksum: 1. Payload: ) from network layer layer
A received ggggggggggggggggggg from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: ggggggggggggggggggg) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received iiiiiiiiiiiiiiiiii from application laver
B received a packet (SEO: 0. ACK: 0. Checksum: 1995, Payload: iiiiiiiiiiiiiiiii) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
```

A received jjjjjjjjjjjjjjjj from application layer

**Commented [DTM1]:** Sender A, being in the Wait For Call 1 From Above State, received message from application layer to send. A takes encapsulates message and sends it to B.

Commented [DTM2]: Receiver B, being in the Wait for Seq 1 from Below state, received packet from network layer. As Seq and Checksum were as expected, B sends data to application layer, makes ACK 1 packet, and sends it to A. B then transitions into Wait for Seq 0 state.

Commented [DTM3]: Sender A, being in the Wait For Ack 1 state, received ACK 1 with checksum as expected. A stops timer and changes to Wait for Call 0 state.

```
Enter the number of messages to simulate: 10
Enter packet loss probability [enter 0.0 for no loss]: .25
Enter packet corruption probability [0.0 for no corruption]:0
Enter average time between messages from sender's layer5 [ > 0.0]:1000
Enter TRACE:1
A received aaaaaaaaaaaaaaaa from application layer
B received a packet (SEQ: \theta, ACK: \theta, Checksum: 1843, Payload: aaaaaaaaaaaaaaa) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
TOLAYER3: PACKET BEING LOST
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received cccccccccccccc from application laver
B received a packet (SEQ: 0, ACK: 0, Checksum: 1881, Payload: cccccccccccc) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: ddddddddddddddddddd from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received eeeeeeeeeeeeeeee from application laver
B received a packet (SEO: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeeee) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
TOLAYER3: PACKET BEING LOST
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1977, Payload: hhhhhhhhhhhhhhhhhhhh) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
```

**Commented [DTM4]:** A, being in Wait For Call 1 state, received message from app layer, sends to B, and starts timer

Commented [DTM5]: But packet lost

Commented [DTM6]: And timer runs out, leading to resent packet

Commented [DTM7]: Which is successfully received

**Commented [DTM8]:** But has its ACK packet lost twice – with A experiencing timeout

**Commented [DTM9]:** Due to the lack of an ACK, B receives duplicate packet

Commented [DTM10]: And sends a successful ACK to A

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received jjjjjjjjjjjjjjjj from application layer

```
Enter the number of messages to simulate: 10
Enter packet loss probability [enter 0.0 for no loss]:0
Enter packet corruption probability [0.0 for no corruption]:.25
Enter average time between messages from sender's layer5 [ > 0.0]:1000
Enter TRACE:1
A received aaaaaaaaaaaaaaaa from application layer
B received a packet (SEQ: \theta, ACK: \theta, Checksum: 1843, Payload: aaaaaaaaaaaaaaa) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET SEGMENT NUMBER
Commented [DTM11]: SEQ number corrupted
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A: Timer Interrupt
                                                                                                         Commented [DTM12]: As A does not receive a proper
ACK, times out, and resends
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
                                                                                                         Commented [DTM13]: Duplicate packet received and
A received ccccccccccccc from application layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
B received a packet (SEQ: \theta, ACK: \theta, Checksum: 1881, Payload: cccccccccccZ) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received dddddddddddddddd from application layer
B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: ddddddddddddddddddddddddddddf from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: ddddddddddddddddd) from network layer layer
A received eeeeeeeeeeeeeeee from application layer
B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeee) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer
A: Timer Interrupt
B received a packet (SEQ: 0, ACK: 0, Checksum: 1919, Payload: eeeeeeeeeeeee) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer
```

A: Timer Interrupt TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA A received a packet (SEO: 0. ACK: 1. Checksum: 1. Payload: Z) from network layer layer A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer A: Timer Interrupt B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: fffffffffffffffff) from network layer layer TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET ACK NUMBER A received a packet (SEQ: 0, ACK: 999999, Checksum: 1, Payload: ) from network layer layer A: Timer Interrupt B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffff) from network layer layer TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer A. Timer Interrunt TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffff) from network layer layer TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer A. Timer Interrunt B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: fffffffffffffffffff) from network layer layer Commented [DTM14]: B receives packet, sends ACK TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET ACK NUMBER TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer Commented [DTM15]: ACK (and payload) corrupted A received a packet (SEO: 1, ACK: 999999, Checksum: 1939, Pavload: fffffffffffffffffff from network layer layer A: Timer Interrupt Commented [DTM16]: Times out, resents B received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: ffffffffffffffffffff from network layer layer Commented [DTM17]: Successfully TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: fffffffffffffffff) from network layer layer A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received iiiiiiiiiiiiiiiiiii from application layer

A received jjjjjjjjjjjjjjjj from application layer

Enter the number of messages to simulate: 10 Enter packet loss probability [enter 0.0 for no loss]:.25 Enter packet corruption probability [0.0 for no corruption]:.25 Enter average time between messages from sender's layer5 [ > 0.0]:1000 Enter TRACE:1 A received aaaaaaaaaaaaaaaa from application layer TOLAYER3: PACKET BEING LOST A: Timer Interrupt B received a packet (SEQ: 0, ACK: 0, Checksum: 1843, Payload: aaaaaaaaaaaaaaa) from network layer layer TOLAYER3: PACKET BEING LOST A: Timer Interrupt B received a packet (SEO: 0. ACK: 0. Checksum: 1843. Payload: aaaaaaaaaaaaaaaaa) from network layer layer A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer Commented [DTM18]: A receives bbbbb from app layer, TOLAYER3: PACKET BEING LOST tries to send to b A: Timer Interrupt Commented [DTM19]: Which is then resent and received TOLAYER3: PACKET BEING LOST TOLAYER3: PACKET BEING LOST A: Timer Interrupt Commented [DTM20]: But has its ACK lost twice Commented [DTM21]: So B is sent a duplicate packet, TOLAYER3: PACKET BEING CORRUPTED Commented [DTM22]: But its ACK is corrupted A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer A: Timer Interrupt Commented [DTM23]: So A resends packet TOLAYER3: PACKET BEING CORRUPTED CORRUPTING PACKET DATA Commented [DTM24]: But is then corrupted A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer Commented [DTM25]: A times out, resends packet A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer Commented [DTM26]: Which is then successfully received and acked A received cccccccccccccc from application laver TOLAYER3: PACKET BEING LOST A: Timer Interrupt TOLAYER3: PACKET BEING LOST A: Timer Interrupt TOLAYER3: PACKET BEING LOST A: Timer Interrupt

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TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
B received a packet (SEO: 0. ACK: 0. Checksum: 1881. Pavload: cccccccccccccc) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
A received ddddddddddddddddd from application laver
B received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: dddddddddddddddddddd from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
A received a packet (SEQ: 1, ACK: 0, Checksum: 1901, Payload: ddddddddddddddddddddddddd) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer
A received eeeeeeeeeeeeeeee from application layer
B received a packet (SEQ: \theta, ACK: \theta, Checksum: 1919, Payload: eeeeeeeeeeeeee) from network layer layer
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer
TOLAYER3: PACKET BEING LOST
A: Timer Interrupt
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 1, ACK: 0, Checksum: 1939, Payload: fffffffffffffffff) from network layer layer
A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: Z) from network layer layer
A received a packet (SEO: 0. ACK: 1. Checksum: 1. Pavload: ) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: Z) from network layer layer
A: Timer Interrupt
B received a packet (SEQ: 0, ACK: 0, Checksum: 1957, Payload: qqqqqqqqqqqqqqqq ) from network layer layer
A received a packet (SEO: 0. ACK: 0. Checksum: 0. Pavload: ) from network layer layer
TOLAYER3: PACKET BEING CORRUPTED
CORRUPTING PACKET DATA
```

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A: Timer Interrupt

```
TOLAYER3: PACKET BEING LOST
```

A: Timer Interrupt

CORRUPTING PACKET DATA

A received a packet (SEQ: 0, ACK: 1, Checksum: 1, Payload: ) from network layer layer

A received iiiiiiiiiiiiiiiiiiii from application layer

B received a packet (SEQ: 0, ACK: 0, Checksum: 1995, Payload: iiiiiiiiiiiiiiii) from network layer layer

A received a packet (SEQ: 0, ACK: 0, Checksum: 0, Payload: ) from network layer layer

A received jjjjjjjjjjjjjjjj from application layer